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Comparative Dissimilation of Xylose and Glucose by *Escherichia coli* and *Citrobacter anindolicum*

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experiments, and as a result the organisms have been placed in different cross-inoculation groups and even into different species.

Experiments by certain investigators within the past few years have indicated, however, that there were exceptions to this general belief. It has been found that some strains of soybean nodule bacteria are capable of producing nodules on cowpeas, and, on the other hand, that cowpea nodule bacteria are capable of producing nodules on soybeans. Some investigators found that while certain species of the soybean bacteria cross-inoculate, the species of cowpea bacteria tested did not cross-inoculate.

The experiments reported here were conducted to determine the cross-inoculation ability of the available laboratory stock cultures of the cowpea and soybean bacteria. Fifteen strains of the soybean bacteria and five strains of the cowpea bacteria were employed to inoculate sterile seed of both cowpeas and soybeans. The plants were grown in the greenhouse for about three weeks. They were then removed from the soil and the presence of nodules on the roots noted.

Three strains of the soybean bacteria did not produce nodules on cowpeas, but the other twelve strains did. On the other hand, none of the cowpea bacteria produced nodules on soybean roots. It is not understood why some of the strains of the soybean bacteria make the cross-inoculation while other strains do not, nor why the cowpea organisms do not make the reciprocal cross to the soybeans. Explanations of these phenomena are now being sought, and field experiments are being conducted to determine their practical significance in the inoculation and growth of these important legume crops.

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COMPARATIVE DISSIMILATION OF XYLOSE AND GLUCOSE BY *ESCHERICHIA COLI* AND *CITRO- BACTER ANINDOLICUM*

O. L. OSBURN AND C. H. WERKMAN

The dissimilative action of *Escherichia coli*, *Citrobacter anindolicum* and various organisms of the intermediate groups on xylose and on dextrose was studied under comparable conditions with the aim of postulating a mechanism of the breakdown of the xylose molecule.

It was found in many cases that there were significant differences in the ratios of the end products obtained from the two sugars. The products found were H_2 , CO_2 , formic, acetic, lactic, and succinic acids, and ethyl alcohol. Acetaldehyde could be isolated by means of sodium bisulphite during the fermentative process.

The dissimilative action of the organisms on pyruvic acid confirmed the mode of breakdown proposed by other investigators but no evidence could be obtained that pyruvic acid was formed at any stage of the process.

All evidence points to splitting of the xylose molecule into fractions other than those containing 2 and 3 carbon atoms.

IOWA STATE COLLEGE,
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CORRELATION OF SHAPE OF FRUITS, COTYLEDONS AND SEEDS IN MELONS

LESLIE M. WEETMAN

The following is a brief report of a statistical study of the relationship between shape of cotyledons, shape of fruits, and shape of seeds in melons and citrons. The ratio of width to length was used as an index of shape.

In groups of many commercial, inbred, and hybrid strains of watermelons, coefficients of correlation obtained by correlating indices of cotyledon shape and fruit shape were positive and highly significant statistically. The coefficient for such a correlation in citrons was practically zero. A small group of plants of *Cucumis* gave a low but significant correlation coefficient between indices of cotyledon shape and fruit shape. Using mean shape indices for each variety, a significant correlation was also found between shape of seeds and shape of cotyledons in twenty-eight commercial varieties of watermelons. Likewise, in the same group, shape of seeds was significantly correlated with shape of fruits.

The cotyledons of watermelons were found to undergo a significant change in shape as the seedlings grew, this change being an increase in length over width.

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CORRELATION STUDIES OF ZEA MAYS UNDER FIELD CONDITIONS

HAROLD F. EISELE AND J. M. AIKMAN

This paper is a report of statistical studies involving correlations between various growth responses of corn plants and factor data obtained in the immediately vicinity of the growing plants.

Weekly growth measurements of the corn plants were obtained and these were correlated with the factor data obtained from recording instruments.

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